Parents' Guide for Fifth Grade Mathematics

By the end of grade five, students increase their facility with the four basic arithmetic operations applied to whole numbers, fractions, and decimals. They locate integers on a number line and ordered pairs of integers on the coordinate plane. They determine rules for numerical patterns, work with expressions including order of operations, and solve single-operation equations involving a single variable. They classify angles, triangles, and quadrilaterals, and analyze relationships among lines, triangles and quadrilaterals. They recognize and determine surface area and volume of three-dimensional shapes, including right prisms. Students understand the concepts of mean, median, mode, and range of data sets and can calculate them. They use line plots, bar graphs, and line graphs to record and analyze data.

The following are specific skills students need to acquire by the end of grade five:

Number Concepts & Operations

- Read and write numbers in standard and expanded form from thousandths to one billion
- Represent numbers, decimals, fractions, percents, and integers using models and symbols (e.g., 84 = 2 x 40 + 4; 108 = 10^2 + 8; 90% = 90 out of 100)
- Identify, read, and locate fractions, mixed numbers, decimals, and integers on the number line
- Represent repeated factors using exponents
- Compare and order integers, fractions (including mixed numbers), and decimals using a variety of methods, including finding a common denominator, or using a number line
- Rewrite mixed numbers as improper fractions and vice versa
- Represent commonly used fractions as decimals and percents (e.g., 1/4 = 0.25 = 25%)
- Model and calculate equivalent forms of a fraction (including simplest form)
- Rename whole numbers as fractions with different denominators (e.g., 5 = 5/1, 3 = 6/2, 1 = 7/7)
- Use rules of divisibility
- Classify whole numbers to 50 as prime, composite, or neither
- Write prime factorization of numbers between 2 and 50 (e.g., 12 = 2^2 x 3)
- Add, subtract, and multiply decimals as well as like and unlike fractions
- Represent division-with-remainders using whole numbers, decimals, or fractions
- Describe the effect of place value when multiplying and dividing whole numbers and decimals by 10, 100, and 1,000
- Make reasonable estimations of fractions and decimal sums, differences, and products
- Multiply and divide a multi-digit number by a two-digit number
- Divide a multi-digit number by a one-digit number

Patterns & Number Relationships

- Identify, analyze, and determine a rule for predicting and extending numerical patterns involving whole numbers, decimals, and fractions
- Use properties and the order of operations involving addition, subtraction, multiplication, division and the use of parentheses to compute with whole numbers, decimals, and fractions
- Write and solve simple equations and inequalities with whole number solutions (e.g., 6x = 54)

Geometry

- Draw, label, and describe line segments, rays, angles, lines, parallel lines, and perpendicular lines
- Classify triangles and quadrilaterals by angles and sides
- Identify and describe pyramids and prisms and their nets
- Identify properties and attributes of solids (i.e., right prisms, pyramids, cylinders, cones) and describe them by the number of edges, faces, and vertices as well as the types of faces
- Locate and plot points defined by ordered pairs on a coordinate plane
- Compare distances of paths between locations on a coordinate plane

Measurement

- Recognize, describe, and determine surface area and volume of 3-D shapes
- Determine the area of polygons and apply to real-world problems
- Compare areas of polygons using different units of measure within the same measurement system (e.g., square feet, square yards, etc.)

Statistics & Data Analysis

- Use the appropriate format to display data (e.g., line plots, bar graphs, line graphs)
- Recognize the differences in representing categorical and numerical data
- Identify and/or calculate the mean, median, mode, range, minimum, and maximum, for a given set of data
- Describe the results of probability experiments as a fraction or ratio between zero and one and predict the probability of the outcome